

**PATENT COOPERATION TREATY**  
**PCT**

**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**  
 (Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>27045AWO ST</b>	FOR FURTHER ACTION		See Form PCT/IPEA/416
International application No. <b>PCT/CH2005/000020</b>	International filing date (day/month/year) <b>17.01.2005</b>	Priority date (day/month/year) <b>19.01.2004</b>	
International Patent Classification (IPC) or national classification and IPC <b>H02P6/18</b>			
Applicant <b>SAIA-BURGESS MURTEN AG</b>			

<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>9</u> sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input type="checkbox"/> (<i>sent to the applicant and to the International Bureau</i>) a total of _____ sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (<i>sent to the International Bureau only</i>) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>																									
<p>4. This report contains indications relating to the following items:</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%; text-align: center; padding: 5px;"><input checked="" type="checkbox"/></td> <td style="width: 15%; text-align: center; padding: 5px;">Box No. I</td> <td style="width: 70%; text-align: left; padding: 5px;">Basis of the report</td> </tr> <tr> <td style="text-align: center; padding: 5px;"><input checked="" type="checkbox"/></td> <td style="text-align: center; padding: 5px;">Box No. II</td> <td style="text-align: left; padding: 5px;">Priority</td> </tr> <tr> <td style="text-align: center; padding: 5px;"><input type="checkbox"/></td> <td style="text-align: center; padding: 5px;">Box No. III</td> <td style="text-align: left; padding: 5px;">Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td style="text-align: center; padding: 5px;"><input type="checkbox"/></td> <td style="text-align: center; padding: 5px;">Box No. IV</td> <td style="text-align: left; padding: 5px;">Lack of unity of invention</td> </tr> <tr> <td style="text-align: center; padding: 5px;"><input checked="" type="checkbox"/></td> <td style="text-align: center; padding: 5px;">Box No. V</td> <td style="text-align: left; padding: 5px;">Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td style="text-align: center; padding: 5px;"><input type="checkbox"/></td> <td style="text-align: center; padding: 5px;">Box No. VI</td> <td style="text-align: left; padding: 5px;">Certain documents cited</td> </tr> <tr> <td style="text-align: center; padding: 5px;"><input type="checkbox"/></td> <td style="text-align: center; padding: 5px;">Box No. VII</td> <td style="text-align: left; padding: 5px;">Certain defects in the international application</td> </tr> <tr> <td style="text-align: center; padding: 5px;"><input type="checkbox"/></td> <td style="text-align: center; padding: 5px;">Box No. VIII</td> <td style="text-align: left; padding: 5px;">Certain observations on the international application</td> </tr> </table>		<input checked="" type="checkbox"/>	Box No. I	Basis of the report	<input checked="" type="checkbox"/>	Box No. II	Priority	<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	<input type="checkbox"/>	Box No. IV	Lack of unity of invention	<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	<input type="checkbox"/>	Box No. VI	Certain documents cited	<input type="checkbox"/>	Box No. VII	Certain defects in the international application	<input type="checkbox"/>	Box No. VIII	Certain observations on the international application
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Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/CH2005/000020

## Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

This report is based on translations from the original language into the following language \_\_\_\_\_ which is the language of a translation furnished for the purposes of:

international search (Rule 12.3 and 23.1(b))  
 publication of the international application (Rule 12.4)  
 international preliminary examination (Rule 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on (replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):

the international application as originally filed/furnished  
 the description:

pages 1-31 \_\_\_\_\_ as originally filed/furnished

pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

the claims:

nos. 1-15 \_\_\_\_\_ as originally filed/furnished

nos.\* \_\_\_\_\_ as amended (together with any statement) under Article 19

nos.\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

nos.\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

the drawings:

sheets 1/6-6/6 \_\_\_\_\_ as originally filed/furnished

sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_

a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3.  The amendments have resulted in the cancellation of:

the description, pages \_\_\_\_\_  
 the claims, nos. \_\_\_\_\_  
 the drawings, sheets/figs \_\_\_\_\_  
 the sequence listing (specify): \_\_\_\_\_  
 any table(s) related to sequence listing (specify): \_\_\_\_\_

4.  This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

the description, pages \_\_\_\_\_  
 the claims, nos. \_\_\_\_\_  
 the drawings, sheets/figs \_\_\_\_\_  
 the sequence listing (specify): \_\_\_\_\_  
 any table(s) related to sequence listing (specify): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.  
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## Box No. II Priority

1.  This report has been established as if no priority had been claimed due to the failure to furnish within the prescribed time limit the requested:
  - copy of the earlier application whose priority has been claimed (Rule 66.7(a)).
  - translation of the earlier application whose priority has been claimed (Rule 66.7(b)).
2.  This report has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rule 64.1). Thus for the purposes of this report, the international filing date indicated above is considered to be the relevant date.
3. Additional observations, if necessary:
  - 1) The claimed priority (CH0400028) does not apply to the subject matter of the description pages 24-31, claims 14 and 15, or the drawings in figures 12 and 13.

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.  
PCT/CH2005/000020Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

## 1. Statement

Novelty (N)	Claims <u>6, 8, 10-13, 15</u>	YES
	Claims <u>1-5, 7, 9, 14</u>	NO
Inventive step (IS)	Claims <u>10, 12, 13</u>	YES
	Claims <u>1-9, 11, 14, 15</u>	NO
Industrial applicability (IA)	Claims <u>1-15</u>	YES
	Claims _____	NO

## 2. Citations and explanations (Rule 70.7)

2) This report makes reference to the following documents:

D1: US 4 520 302 A (HILL ROLAND J ET AL) 28 May 1985 (1985-05-28)

D2: US 5 173 650 A (HEDLUND ET AL) 22 December 1992 (1992-12-22)

D3: EP 0 151 296 A (BERGER GMBH & CO GERHARD) 14 August 1985 (1985-08-14)

## 3) INDEPENDENT CLAIM 1

The present application does not meet the requirements of PCT Article 33(1), because the subject matter of claim 1 lacks novelty within the meaning of PCT Article 33(2). D1 discloses (the reference signs in parentheses refer to said document):

a method for commutating electromechanical commutatorless actuators having a rotor and a stator with at least one stator winding (A, B) that are operated by a constant current (I):  
 - at least one of the actuator windings (A, B) being acted upon by a constant

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reference current,

- waiting until a stationary state with a stationary rotor is achieved,
- a value representing the voltage that acts upon the actuator winding in the stationary state being determined as a reference value ( $f_{chos}$ ) for the commutation (cf. column 5, lines 33-56),
- and while the motor is running, the point in time being determined when
  - the reference value is achieved when operating using the constant reference current, or when
  - a commutation value calculated from the reference value for the present operating current is achieved when operating using an operating current that diverges from the reference current (cf. column 6, lines 14-54),
- and the commutation being triggered, with a predetermined time difference greater than or equal to zero, after the point in time when the reference value is reached, the time difference being selected such that there is essentially no change in the polarity of the actuator torque (cf. column 7, line 67 to column 8, line 8).

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

**INDEPENDENT CLAIM 14**

The present application does not meet the requirements of PCT Article 33(1), because the subject matter of claim 14 lacks novelty within the meaning of PCT Article 33(2).

D1 discloses a device with all of the features contained in claim 14 and the method to be carried out in the processor.

**INDEPENDENT CLAIM 15**

The present application does not meet the requirements of PCT Article 33(1), because the subject matter of claim 15 does not involve an inventive step within the meaning of PCT Article 33(3).

The use of the method known from D1 for the low-vibration actuation of servomotors is not regarded as inventive.

**4) DEPENDENT CLAIMS 2-9, 11 AND 12**

Claims 2-9, 11 and 12 contain no features that, in combination with the features of any claim to which they refer, meet the PCT requirements for novelty and inventive step.

The features of dependent claims 2-5, 7 and 9 can be found in D1 (cf. column 4, line 5 to column 8, line 8) and therefore cannot be

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International application No.  
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regarded as novel (PCT Article 33(2)).

The features of dependent claims 6, 8 and 11 are each only one of several obvious possibilities from which a person skilled in the art would choose according to the circumstances in order to solve the problem of interest, without thereby being inventive.

The feature of dependent claim 12, namely measuring the input voltage in order to determine the rotor position rather than assuming it is constant, was already used for the same purpose in a similar method; cf. D2, in particular column 4, lines 3-29. Therefore it was obvious to a person skilled in the art to use this feature to like effect in a method according to D1 and in this way to arrive at a method according to claim 12.

## 5) DEPENDENT CLAIMS 10 AND 13

The combination of features contained in the dependent claims is neither known from nor rendered obvious by the available prior art. The reasons therefor are the following:

The following combinations of features are neither known from nor rendered obvious by the available prior art:

## Combination of features a)

- The features of claims 1, 4, 5 and 10

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- The commutation of the motor winding is carried out near the zero crossing of the back EMF voltage (cf. page 3, lines 18-23), and
- The back EMF voltage is determined by the switch-on and switch-off times for the current.

## Combination of features b)

- The features of claims 1, 4, 12 and 13
- The commutation of the motor winding is carried out near the zero crossing of the back EMF voltage (cf. page 3, lines 18-23), and
- The back EMF voltage is determined by the switch-on and switch-off times for the current.

The reasons therefor are the following:

In D1, the resulting BEMF voltage is neglected and the inductance of the winding is determined from the switch-on and switch-off times for the current, which inductance is used to determine the time for commutation.

Although D1 indicates to a person skilled in the art that the BEMF voltage can be neglected only under certain circumstances and D3 discloses carrying out the commutation at the zero crossing of the BEMF voltage,

**INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY**

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**Box No. V** Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

there is nothing that would prompt a person skilled in the art to keep constant the sum of the switch-on and switch-off times valid for the commutation such that the switch-on time could be recalculated in a simple manner for other operating conditions (combination of features a)).

Furthermore, the prior art contains nothing that would prompt a person skilled in the art to keep the switch-on time constant such that the switch-off time could be determined as the difference between the switching time sum and the switch-on time (combination of features b)).